WHAT IS CLAIMED IS:

1. A method for enhancing neurologic function in a subject, said method comprising delivering a neurologic function enhancing effective amount of light energy having a wavelength in the visible to near-infrared wavelength range to a target area of the brain of the subject, wherein delivering the neurologic function enhancing effective amount of light energy comprises delivering a predetermined power density of light energy to the target area of the brain, wherein the predetermined power density is a power density of at least about 0.01 mW/cm^2 at the target area.

2. A method for preventing, reducing the severity of a later heat stroke in a subject, reducing the incidence of future heat stroke, and/or reducing the likelihood of onset heat stroke in a subject, said method comprising delivering light energy having a wavelength in the visible to near-infrared wavelength range and a predetermined power density through the skull to at least one target area of the brain of a subject, wherein the wavelength, power density and amount of the light energy delivered are sufficient to prevent, reduce the severity, or reduce the incidence of heat stroke in the subject.

3. A method according to Claim 1 or 2 wherein the predetermined power density is a power density selected from the range of about 0.01 mW/cm^2 to about 100 mW/cm^2.

4. A method according to Claim 3 wherein the predetermined power density is selected from the range of about 0.01 mW/cm^2 to about 15 mW/cm^2 .

5. A method according to Claim 1 or 2 wherein the light energy has a wavelength of about 630 nm to about 904 nm.

6. A method according to Claim 5 wherein the light energy has a wavelength of about 780 nm to about 840 nm.

7. A method according to Claim 1 wherein delivering a neurologic function enhancing effective amount of light energy to the target area of the brain comprises placing a light source in contact with a region of skin adjacent the target area of the brain.

8. A method according to Claim 2 wherein delivering the light energy to the brain comprises placing a light source in contact with a region of skin adjacent a target area of the brain.

9. A method according to Claim 1 wherein delivering a neurologic function enhancing effective amount of light energy to the target area of the brain comprises placing a light source in contact with a region of skin contralateral the target area of the brain.

10. A method according to Claim 2 wherein delivering the light energy to the brain comprises placing a light source in contact with a region of skin contralateral to a target area of the brain.

11. A method according to Claim 1 or 2 wherein delivering light energy comprises determining a surface power density of the light energy sufficient to deliver the predetermined power density of light energy to the target area of the brain.

12. A method according to Claim 11 wherein determining a surface power density of the light energy sufficient to deliver the predetermined power density of light energy to the area of the brain comprises determining the surface power density of the light energy sufficient for the light energy to traverse the distance between the skin surface and the area of the brain.

13. A method according to Claim 12 wherein determining the surface power density further comprises determining the surface power density sufficient to penetrate the skull.

14. A method according to Claim 1, wherein the subject has Alzheimer's disease, dementia, depression, stroke, heat stroke, head trauma, or neurodegeneration.

15. A method according to Claim 1 or 2, wherein the treatment proceeds for a period of about 30 seconds to about 2 hours.

16. A method of increasing neurologic function by increasing the production of ATP by neurons, comprising:

irradiating neurons with light energy having a wavelength in the near infrared to visible portion of the electromagnetic spectrum for at least about 1 second;

wherein the power density of said light energy at the neurons is at least about 0.01 mW/cm^2, whereby the ATP production of neurons is increased.

17. A method according to Claim 16 wherein the predetermined power density is a power density selected from the range of about 0.01 mW/cm^2 to about 100 mW/cm^2.

18. A method according to Claim 17 wherein the predetermined power density is less than about 15 mW/cm^2 .

19. A method according to Claim 16 wherein the light energy has a wavelength of about 630 nm to about 904 nm.

20. A method according to Claim 19 wherein the light energy has a wavelength of about 780nm to about 840nm.

21. A method for treating damage or illness in the central nervous system in a mammal or human, comprising:

delivering an effective amount of light energy to an *in vitro* culture comprising progenitor cells; and

implanting the cells into the central nervous system of a mammal or human,

wherein delivering an effective amount of light energy includes delivering light having a wavelength in the visible to near-infrared wavelength range and a power density of at least about 0.01 mW/cm^2 to the cells in culture.

22. A method according to Claim 21, further comprising delivering light energy having a wavelength in the visible to near-infrared wavelength range to the cells following implantation.

23. A method according to Claim 22, wherein the light energy delivered to said cells following implantation has a predetermined power density and the power density and amount of the light energy delivered are sufficient to enhance the survival of the transplanted cells.